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facts presented, and such deductions as he makes in regard to climate are conservative. The last chapter will be somewhat startling to many readers, as Zeiller thinks there is very little evidence from fossil plants in favor of gradual evolution. He states that in almost every case, species, genera, families, and groups appear highly specialized and in their permanent form from the first. So-called intermediate forms like *Cheirostrobos* appear long after the forms they are supposed to connect. Genera and species that vary now have always varied, and the limits of variation now and in the past have been the same and definitely prescribed. In short, Zeiller believes that the evolution of all groups is a matter almost purely of speculation. Doubtless most botanists will fail to accept Zeiller's views as to evolution, and yet it may be well to put a brake now and then to unlimited speculation; a perusal of Zeiller's final chapter certainly compels one to do that.—H. C. COWLES.

#### Plant diseases.

IN 1882 the first edition of Robert Hartig's *Lehrbuch der Baumkrankheiten* appeared. This book met with instant favor and was at once recognized as a standard reference work for diseases of trees, especially those caused by the higher fungi. In 1889 the second edition appeared and the favorable reception accorded the first edition was repeated. The third edition has now been issued—this time, however, with a changed title.<sup>5</sup> The change of name from *Baum-* to *Pflanzenkrankheiten* would naturally lead one to expect that the discussion of the subject had been extended so as to include non-woody plants not considered in the previous editions. This is not the case, however, for practically the same plants are treated in the edition before us as in the others. The work is still confined in the main to diseases of woody plants. This is shown by the fact that of the 280 figures only eleven illustrate diseases or parasitic fungi of non-woody plants. Thirty-one pages are given to the discussion of the rusts affecting woody plants and a little over two pages to those affecting non-woody plants. Aside from about six pages given to smuts and short references under *Claviceps purpurea*, *Cystopus candidus*, *Plasmodiophora brassicae*, and the bacterial diseases of hyacinths and potato, the other notes on diseases of non-woody plants caused by fungi are only incidental. The book is divided into five main headings, viz.: (1) injuries caused by plants; (2) diseases caused by atmospheric influences; (3) diseases caused by the action of injurious substances; (4) diseases due to soil conditions; (5) wounds. With the exception of one or two paragraphs, however, consideration is given under the last four heads to woody plants only.

<sup>5</sup>HARTIG, ROBERT: *Lehrbuch der Pflanzenkrankheiten*. Für Botaniker, Forstleute, Landwirthe, und Gärtner. Dritte, völlig neu bearbeitete Auflage des Lehrbuches der Baumkrankheiten. 8vo. pp. ix + 324. figs. 280. pl. 1 (colored). Berlin: Julius Springer. 1900. M 10.

As compared with the second edition, a somewhat fuller discussion is given to diseases caused by fungi as a whole, and particularly to Ustilagineæ and Uredineæ. The injuries caused by lightning are much more extensively treated than in the previous edition, being given over fourteen pages and twenty-six figures instead of two pages and no figures. The number of figures in the book as a whole has been more than doubled, many being reproductions of photographs to show the habit of certain diseases, while others are detailed drawings made by the author. The colored plate which appeared in the first edition has been retained. In view of the great activity shown in recent years in the study and description of bacterial diseases of plants it seems peculiar to find only two pages devoted to this important subject. Practically the same introductory remarks are given as in the second edition, to the effect that bacterial diseases of plants are not and cannot be numerous in the nature of things, owing to the firm cellulose walls and acid sap characteristic of most plants. But five bacterial diseases are mentioned, two being considered as not yet proved. They are the yellow rot of the hyacinth, the wet rot of the potato, pear blight, and more doubtfully sorghum blight, and the twig gall of the olive. It seems strange that no mention is made of several other economically very important bacterial diseases which have been so carefully and fully described by European and American investigators. A very noticeable feature is the fact that except for a few citations in the introduction to general works, all the publications cited are those by the author himself. He explains this as being done to make these publications more available, since they are scattered through numerous periodicals, etc. There is no need, he believes, for a general bibliography in such a work.

The typography is good, and the figures are mostly excellent. The only typographical error noted is in the legend to *figure 123*, where the name *Cryptospora* is printed instead of *Calyptospora*. As a whole the book is likely to prove valuable, not as a general work, however, but rather as a text-book of diseases of trees.—ERNST A. BESSEY.

#### MINOR NOTICES.

HERMAN B. DORNER (Proc. Ind. Acad. Sci. 1899: 116–129) has investigated the resin ducts and strengthening cells of the leaves of six species of *Abies*, and five of *Picea*, and has discovered differences which enable him to distinguish them. The paper contains text cuts showing the varying structures.—J. M. C.

THE LAST NUMBER of the *Icones Florae Japonicae* bears the date September 1, 1900, and is no. 8 of the spermatophyte and pteridophyte series, edited by T. Makino of the Imperial University at Tōkyō. The present number contains illustrations of species of *Davallia*, *Aldrovanda*, *Stigmatodactylus*, and *Saccolabium*.—J. M. C.